

EXERCISES

For more practice, see *Extra Practice*.

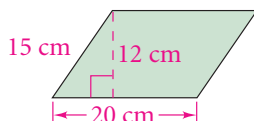
Practice and Problem Solving

A Practice by Example

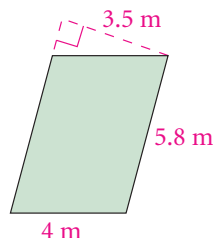
Example 1
(page 349)

Find the area of each parallelogram.

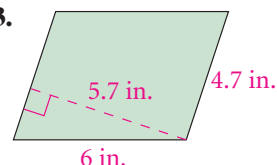
1.



2.



3.



Example 2
(page 349)

Coordinate Geometry Find the area of the parallelogram with the given vertices.

4. $A(2, 0), B(7, 0), C(8, 4), D(3, 4)$

5. $E(-4, 0), F(-1, 0), G(1, -3), H(-2, -3)$

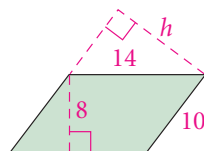
6. $I(2, 2), J(4, 2), K(2, -3), L(0, -3)$

7. $M(-6, -1), N(-5, 0), P(1, 0), Q(0, -1)$

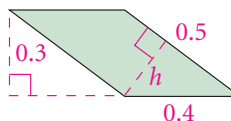
Example 3
(page 350)

Find the value of h for each parallelogram.

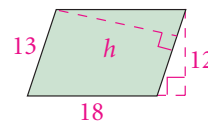
8.



9.



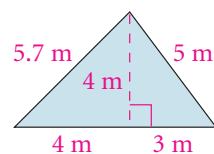
10.



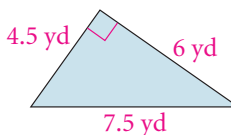
Example 4
(page 350)

Find the area of each shaded triangle.

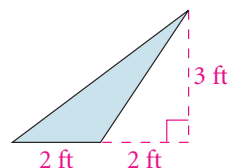
11.



12.



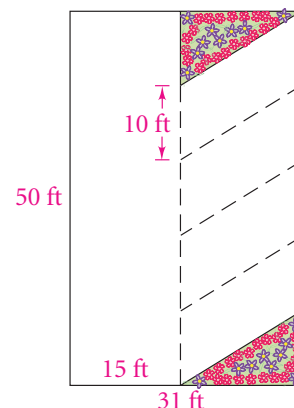
13.



Example 5
(page 351)

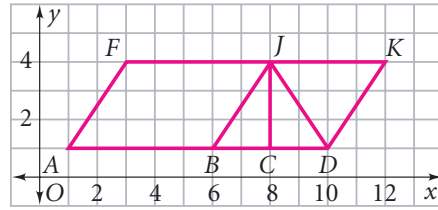
14. **Landscaping** Taisha's Bakery has a plan for a 50 ft-by-31 ft parking lot. The four parking spaces are congruent parallelograms, the driving region is a rectangle, and the two unpaved areas for flowers are congruent triangles.

- Find the area of the surface to be paved by adding the areas of the driving region and the four parking spaces.
- Describe another method for finding the area of the surface to be paved.
- Use your method from part (b) to find the area. Then compare answers from parts (a) and (b) to check your work.



Find the area of each figure.

15. $\square ABJF$ 16. $\triangle BDJ$
 17. $\triangle DKJ$ 18. $\square BDKJ$
 19. $\square ADKF$ 20. $\triangle BCJ$
 21. $ADJF$



B Apply Your Skills



Need Help?

The line $x = a$ is vertical and crosses the x -axis at $x = a$.

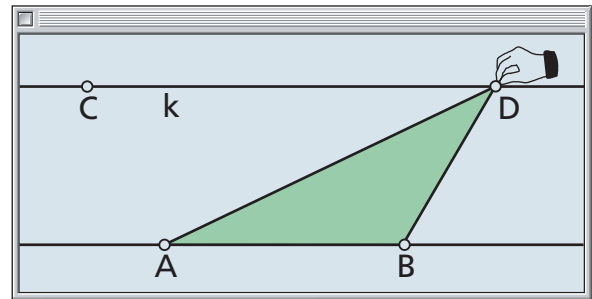
22. The area of a parallelogram is 24 in.^2 and the height is 6 in. Find the corresponding base.
 23. An isosceles right triangle has area of 98 cm^2 . Find the length of each leg.

- 24. Algebra** In a triangle, a base and a corresponding height are in the ratio $3 : 2$. The area is 108 in.^2 . Find the base and the corresponding height.

In Exercises 25–28, (a) graph the lines and (b) find the area of the triangle enclosed by the lines.

25. $y = x, x = 0, y = 7$ 26. $y = x + 2, y = 2, x = 6$
 27. $y = -\frac{1}{2}x + 3, y = 0, x = -2$ 28. $y = \frac{3}{4}x - 2, y = -2, x = 4$

- 29. Technology** Ki used geometry software to create the figure at the right. She constructed \overleftrightarrow{AB} and a point C not on \overleftrightarrow{AB} . Then she constructed line k parallel to \overleftrightarrow{AB} through point C . Next, Ki constructed point D on line k as well as \overline{AD} and \overline{BD} . She dragged point D along line k to manipulate $\triangle ABD$. How does the area of $\triangle ABD$ change? Explain.



Find the area of each figure.

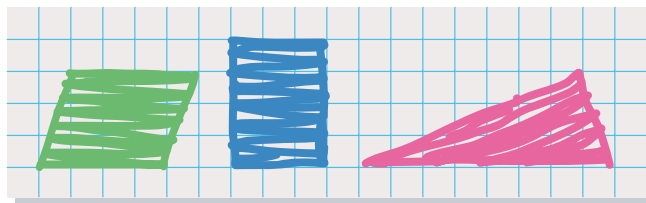
30. 31. 32.

33. Find the area of the yellow triangular patch in the large field in the photo at the left. It has a base of 60 yd and a height of 140 yd.
 34. **Open-Ended** Using graph paper, draw an acute triangle, an obtuse triangle, and a right triangle, each with area 12 units^2 .



Exercise 33

35. **Probability** Ann drew these three figures on a grid. A fly lands at random at a point on the grid.

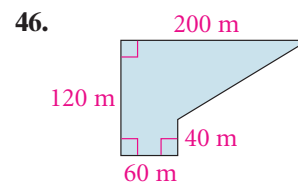
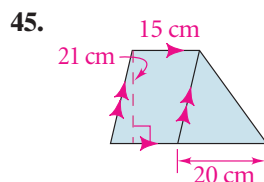
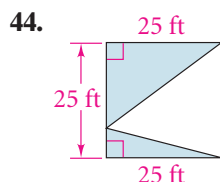


- a. **Writing** Is the fly more likely to land on one of the figures or on the blank grid? Explain.
- b. Suppose you know the fly lands on one of the figures. Is the fly more likely to land on one figure than on another? Explain.

Coordinate Geometry Find the area of a polygon with the given vertices.

36. $A(3, 9), B(8, 9), C(2, -3), D(-3, -3)$ 37. $E(1, 1), F(4, 5), G(11, 5), H(8, 1)$
38. $M(-2, -5), L(1, -5), N(2, -2)$ 39. $R(-7, 2), S(-3, -1), T(3, -1)$
40. $W(1, 2), X(1, 6), Y(4, 1)$ 41. $A(-8, 0), B(-7, 4), C(-3, 3)$
42. $D(0, 0), E(2, 4), F(6, 4), G(6, 0)$ 43. $K(-7, -2), L(-7, 6), M(1, 6), N(7, -2)$

Find the area of each figure.



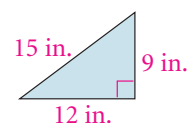
Challenge **History** The ancient Greek mathematician Heron is most famous for this formula for the area of a triangle in terms of the lengths of its sides a , b , and c .

$$A = \sqrt{s(s-a)(s-b)(s-c)}, \text{ where } s = \frac{1}{2}(a+b+c)$$

Use Heron's Formula and a calculator to find the area of each triangle. Round your answer to the nearest whole number.

47. $a = 8$ in., $b = 9$ in., $c = 10$ in. 48. $a = 15$ m, $b = 17$ m, $c = 21$ m
49. $a = 6$ cm, $b = 7$ cm, $c = 11$ cm 50. $a = 10$ ft, $b = 10.2$ ft, $c = 11$ ft

51. a. Use Heron's Formula to find the area of the triangle at the right.
- b. Verify your answer to part (a) by using the formula $A = \frac{1}{2}bh$.

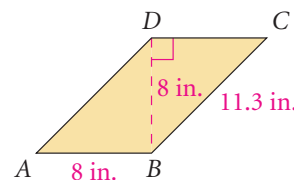




Standardized Test Prep

Multiple Choice

52. The lengths of the sides of a right triangle are 10 in., 24 in., and 26 in. What is the area of the triangle?
 A. 116 in.^2 B. 120 in.^2 C. 130 in.^2 D. 156 in.^2
53. What is the area of $\square ABCD$ at the right?
 F. 32 in.^2 G. 64 in.^2
 H. 91.2 in.^2 I. 45.6 in.^2
54. A parallelogram has adjacent sides of 176 ft and 312 ft. The altitude to the shorter side is 290 ft. What is the area of the parallelogram?
 A. $51,040 \text{ ft}^2$ B. $51,352 \text{ ft}^2$ C. $54,912 \text{ ft}^2$ D. $55,202 \text{ ft}^2$
55. The perimeter of an equilateral triangle is 60 m. Its height is 17.3 m. What is its area?
 F. 173 m^2 G. 200 m^2 H. 348 m^2 I. 1044 m^2



Short Response

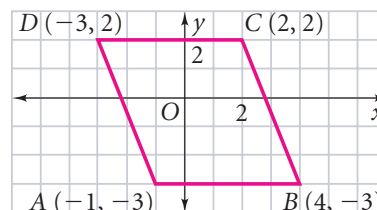


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Online lesson quiz at
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Web Code: afa-0701

56. a. For $\square ABCD$, explain how to determine the length of an altitude drawn to base \overline{AB} .
 b. Find the area of $\square ABCD$.

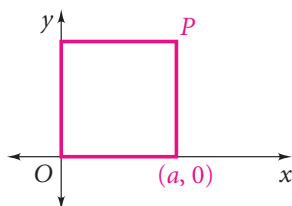


Mixed Review

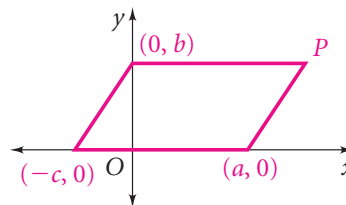
Lesson 6-7

Give the coordinates for point P without using any new variables.

57. square



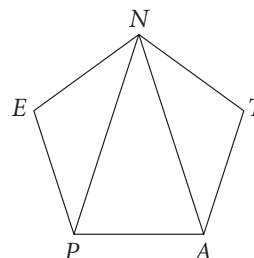
58. parallelogram



Lesson 4-5

The base of the isosceles triangle is a side of a regular pentagon $PENTA$. Find the measure of each angle.

59. $\angle APE$ 60. $\angle APN$
 61. $\angle PAN$ 62. $\angle PNA$
 63. $\angle EPN$ 64. $\angle ANT$



Lesson 3-7

Use a compass and straightedge for the following constructions.

65. Draw a segment and label it \overline{AB} . Construct \overleftrightarrow{AD} so that $\overleftrightarrow{AD} \perp \overline{AB}$ at point A .
 66. Draw a segment. Label it \overline{EF} . Construct a line \overleftrightarrow{GH} so that $\overleftrightarrow{GH} \parallel \overline{EF}$.
 67. Draw a segment and label it \overline{KL} . Draw a point X not on \overleftrightarrow{KL} . Construct a perpendicular from point X to \overleftrightarrow{KL} (or to \overleftrightarrow{KL}).